

# United States Patent and Trademark Office



UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,345	12/14/2001	Haruo Furuta	217208US2	1156
22850	7590 02/25/2004		EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.			OWENS, DOUGLAS W	
1940 DUKE ALEXANDI	SIREEI RIA, VA 22314		ART UNIT	PAPER NUMBER
	•		2811	
			DATE MAILED: 02/25/2004	

Please find below and/or attached an Office communication concerning this application or proceeding.

<u> </u>	Application No.	Applicant(s)	
	1		
Office Action Summany	10/014,345	FURUTA ET AL.	
Office Action Summary	Examiner	Art Unit	21
The MAN INC DATE of this communication of	Douglas W Owens	2811	pw
The MAILING DATE f this communication ap Period for Reply	opears on the cover sneet v	nui uie correspondence add	iress
A SHORTENED STATUTORY PERIOD FOR REP THE MAILING DATE OF THIS COMMUNICATION  - Extensions of time may be available under the provisions of 37 CFR 1 after SIX (6) MONTHS from the mailing date of this communication.  - If the period for reply specified above is less than thirty (30) days, a re  - If NO period for reply is specified above, the maximum statutory perior  - Failure to reply within the set or extended period for reply will, by statu  - Any reply received by the Office later than three months after the maili earned patent term adjustment. See 37 CFR 1.704(b).  Status		reply be timely filed irty (30) days will be considered timely NTHS from the mailing date of this con BANDONED (35 U.S.C. § 133).	mmunication.
1) Responsive to communication(s) filed on 27.	s action is non-final.		
<ul> <li>2a) This action is FINAL.</li> <li>2b) This</li> <li>3) Since this application is in condition for allow closed in accordance with the practice under</li> </ul>	ance except for formal ma		merits is
Disposition of Claims			
4) ☐ Claim(s) 5-9 and 11-13 is/are pending in the 4a) Of the above claim(s) is/are withdres 5) ☐ Claim(s) is/are allowed. 6) ☐ Claim(s) 5,7-9,11 and 13 is/are rejected. 7) ☐ Claim(s) 6 and 12 is/are objected to. 8) ☐ Claim(s) are subject to restriction and/	awn from consideration.		
Application Papers			
9) The specification is objected to by the Examination The drawing(s) filed on is/are: a) and applicant may not request that any objection to the Replacement drawing sheet(s) including the correct 11) The oath or declaration is objected to by the Examination is objected to by the Examination is objected.	ccepted or b) objected to e drawing(s) be held in abeya ction is required if the drawing	ance. See 37 CFR 1.85(a). g(s) is objected to. See 37 CF	
Priority under 35 U.S.C. §§ 119 and 120			
12) Acknowledgment is made of a claim for foreignal All b) Some * c) None of:  1. Certified copies of the priority documer 2. Certified copies of the priority documer 3. Copies of the certified copies of the priority application from the International Bure.  * See the attached detailed Office action for a list 13) Acknowledgment is made of a claim for domes since a specific reference was included in the from 37 CFR 1.78.  a) The translation of the foreign language purpose 14) Acknowledgment is made of a claim for domes reference was included in the first sentence of the company of the foreign language purpose 14.	nts have been received. Ints have been received in a cority documents have been au (PCT Rule 17.2(a)). Inst of the certified copies no stic priority under 35 U.S.C irst sentence of the specific provisional application has stic priority under 35 U.S.C	Application No  In received in this National Solution of the provisional cation or in an Application Induced the process of the provision of the provis	application) Data Sheet. a specific
Attachment(s)			
1) Notice of References Cited (PTO-892) 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s)	5) 🔲 Notice of	Summary (PTO-413) Paper No(s Informal Patent Application (PTO	

Application/Control Number: 10/014,345

Art Unit: 2811

### **DETAILED ACTION**

## Claim Rejections - 35 USC § 103

- 1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 2. Claims 5 and 7 9, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent No. 6,417,037 to Feng in view of US patent No. 6,465,866 to Park et al.

Regarding claims 5 and 7 - 9, Feng teaches a semiconductor device (Fig. 6) comprising:

an isolation film (12) in a surface of a semiconductor substrate (10);

first and second transistors (24, 22) on first and second active regions defined by the isolation film;

the first transistor having a first gate insulating film (16) with a first thickness; and the second transistor having a second gate insulating film (14) with a second thickness, wherein the first thickness is greater than the second thickness.

Feng does not teach a semiconductor device, wherein the isolation film has a first and second recessed portion in an edge portion on the side of the active region, wherein the depth is defined as a depth at which the threshold voltage is constant according to a characteristic of variation in threshold voltage of the first or second transistor with respect to variation in depth. Park et al. teaches a semiconductor device

Art Unit: 2811

(Fig. 4), wherein the isolation film (50) has a first and second recessed portion in an edge portion on the side of the active region, wherein the depth is defined as a vertical height between a main surface of the first active region and a deepest part of the recessed portion, includes the range of not less than 10 nm (Col. 2, lines 59 – 63; Col. 4, lines 62 – 65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Park et al. into the device taught Feng, since it is desirable to prevent the "hump" phenomenon and inverse narrow width effect (Park et al., Col. 2, lines 41 – 44).

It would have also been obvious to provide the isolation film and recessed area around the active region since the purpose of the isolation film is to isolate the active area.

Regarding claims 11 and 13, Feng does not explicitly teach a first transistor that forms an I/O circuit and the second transistor forms an analog circuit. Feng teaches a device, wherein the first transistor is ideal for use in an I/O circuit and a second transistor that is ideal for use in an analog circuit since the first transistor has a thick gate oxide and the second transistor has a relatively thin gate oxide. It would have been obvious to use the device for the purpose it is designed. Moreover, this is considered a suggested use limitation and is not given any patentable weight.

#### Allowable Subject Matter

3. Claims 6 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Application/Control Number: 10/014,345 Page 4

Art Unit: 2811

4. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose a semiconductor device as discussed above, and further including an insulation film that has another recessed portion, wherein the additional recessed portion is shallower than the first recessed portion.

## Response to Arguments

5. Applicant's arguments with respect to claims 5 – 9 and 11 – 13 have been considered but are most in view of the new ground(s) of rejection.

#### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800